

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A data writing apparatus for converting pixel signals outputted from an image reading apparatus to pixel data as digital signals and for writing the pixel data to a data storage memory, the image reading apparatus comprising:

a first sensor including light receiving elements provided per pixel and arranged in a primary scanning direction;

a second sensor including light receiving elements provided per pixel, arranged in the primary scanning direction and disposed in parallel to and at a predetermined distance away from the first sensor in a secondary scanning direction;

a first outputting device that outputs respective pixel signals obtained from the respective light receiving elements constituting the first sensor in order of arrangement of the light receiving elements;

a second outputting device that outputs respective pixel signals obtained from the respective light receiving elements arranged at even-numbered positions among the light receiving elements constituting the second sensor in order of arrangement of the light receiving elements; and

a third outputting device that outputs respective pixel signals obtained from the respective light receiving elements arranged at even-numbered positions among the light receiving elements constituting the second sensor in order of arrangement of the light receiving elements,

the data writing apparatus comprising:

a pixel data outputting device that converts the pixel signals outputted from the first, second and third outputting devices to the pixel data as digital signals and outputs

the pixel data as a serial data stream in a predetermined pattern showing output order of the respective outputting devices;

a calculating device that repeats add and subtract operation to a predetermined initial value according to the output pattern of the pixel data from the pixel data outputting device to calculate pixel positions of the respective pixel data outputted from the pixel data outputting device;

an address setting device that sets destination memory addresses to write the pixel data outputted from the pixel data outputting device based on the calculation results by the calculating device; and

a writing device that writes the pixel data outputted from the pixel data outputting device to areas in the data storage memory which correspond to the destination memory addresses set by the address setting device.

2. (Original) The data writing apparatus as set forth in claim 1 wherein

said calculating device includes a difference calculating unit that calculates a difference between the pixel position of the pixel data to be outputted from said pixel data outputting device and the pixel position of the pixel data outputted last time,

said address setting device includes an address storing unit that stores the destination memory address, and the address setting device updates the destination memory address based on the difference calculated by the difference calculating unit and the address stored in the address storing unit.

3. (Original) The data writing apparatus as set forth in claim 2 wherein said calculating device comprising:

a first calculating unit that repeats add and subtract operation to a predetermined first initial value to sequentially calculate pixel positions of the pixel data corresponding to said pixel signals outputted from said first outputting device;

a second calculating unit that repeats add and subtract operation to a predetermined second initial value to sequentially calculate pixel positions of the pixel data corresponding to said pixel signals outputted from said second outputting device; and

a third calculating device that repeats add and subtract operation to a predetermined third initial value to sequentially calculate pixel positions of the pixel data corresponding to said pixel signals outputted from said third outputting device,

the calculating device being designed to selectively output one of the calculation results by said first, second and third calculation units as a calculation result of the calculating device, depending on the output pattern of the pixel data from said pixel data outputting device.

4. (Original) The data writing apparatus as set forth in claim 2 wherein said writing device comprising:

a first FIFO memory that stores the pixel data corresponding to the pixel signals obtained from said first sensor among the pixel data outputted from said pixel data outputting device; and

a second FIFO memory that stores the pixel data corresponding to the pixel signals obtained from said second sensor among the pixel data outputted from the pixel data outputting device,

the writing device being designed to be capable of writing a plurality of pixel data stored in the respective FIFO memories in a lump to said data storage memory.

5. (Original) The data writing apparatus as set forth in claim 4 wherein said writing device accesses the areas in said data storage memory which correspond to said destination memory addresses set by said address setting device using byte enable signal, and writes a plurality of pixel data in a lump to the areas.

6. (Currently Amended) An image processing apparatus for making an external image forming apparatus to form an image based on a group of pixel data written to a memory by an image reading apparatus, the image reading apparatus comprising:

- a first sensor including light receiving elements provided per pixel and arranged in a primary scanning direction;
- a second sensor including light receiving elements provided per pixel, arranged in the primary scanning direction and disposed in parallel to and at a predetermined distance away from the first sensor in a secondary scanning direction;
- a first outputting device that outputs respective pixel signals obtained from the respective light receiving elements constituting the first sensor in order of arrangement of the light receiving elements;
- a second outputting device that outputs respective pixel signals obtained from the respective light receiving elements arranged at even-numbered positions among the light receiving elements constituting the second sensor in order of arrangement of the light receiving elements;
- a third outputting device that outputs respective pixel signals obtained from the respective light receiving elements arranged at odd-numbered positions among the light receiving elements constituting the second sensor in order of arrangement of the light receiving elements;
- a pixel data outputting device that converts the pixel signals outputted from the first, second and third outputting devices to pixel data as digital signals and outputs the pixel data as a serial data stream in a predetermined pattern; and
- a writing device that sequentially writes the respective pixel data outputted from the pixel data outputting device to the memory,

the image processing apparatus comprising a restoration outputting device that reads and outputs the respective pixel data from the memory in the order corresponding to pixel arrangement of the image to be formed by the external image forming apparatus based on the ~~output~~-predetermined pattern of the pixel data output from the pixel data outputting device.